

Attachment to 425: Justification and References

Inappropriate Nutrition Practices for Children

Justification

425.1 Routinely feeding inappropriate beverages as the primary milk source.

Goat's milk, sheep's milk, imitation and substitute milks (that are unfortified or inadequately fortified) do not contain nutrients in amounts appropriate as a primary milk source for children (1-4). Non-fat and reduced-fat milks are not recommended for use with children from 1 to 2 years of age because of the lower calorie density compared with whole-fat products (1, 5). The low-calorie, low-fat content of these milks requires that increased volume be consumed to satisfy caloric needs. Infants and children under two using reduced fat milks gain at a slower growth rate, lose body fat as evidenced by skinfold thickness, lose energy reserves, and are at risk of inadequate intake of essential fatty acids.

425.2 Routinely feeding a child any sugar-containing fluids.

Abundant epidemiologic evidence from groups who have consumed low quantities of sugar as well as from those who have consumed high quantities shows that sugar—especially sucrose—is the major dietary factor affecting dental caries prevalence and progression (6). Consumption of foods and beverages high in fermentable carbohydrates, such as sucrose, increases the risk of early childhood caries and tooth decay (6, 7).

425.3 Routinely using nursing bottles, cups, or pacifiers improperly.

Dental caries is a major health problem in U.S. preschool children, especially in low-income populations (8). Most implicated in this rampant disease process is prolonged use of baby bottles during the day or night, containing fermentable sugars, (e.g., fruit juice, soda, and other sweetened drinks), pacifiers dipped in sweet agents such as sugar, honey or syrups, or other high frequency sugar exposures (6). Solid foods such as cereal should not be put into a bottle for feeding; this is a form of force feeding (9) and does not encourage the child to eat the cereal in a more developmentally-appropriate way.

Additional justifications for the examples include:

- The American Academy of Pediatrics (AAP) and the American Academy of Pedodontics recommend that children not be put to bed with a bottle in their mouth (10, 11). While sleeping with a bottle in his or her mouth, a child's swallowing and salivary flow decreases, thus creating a pooling of liquid around the teeth (12). Propping the bottle can cause: ear infections because of fluid entering the middle ear and not draining properly; choking from liquid flowing into the lungs; and tooth decay from prolonged exposure to carbohydrate-containing liquids (13).
- Pediatric dentists recommend that parents be encouraged to have infants drink from a cup as they approach their first birthday, and that infants are weaned from the bottle by 12-14 months of age (14).
- The practice of allowing children to carry or drink from a bottle or cup of juice for periods throughout the day leads to excessive exposure of the teeth to carbohydrate, which promotes the development of dental caries (10). Allowing toddlers to use a bottle or cup containing fermentable

carbohydrates unsupervised during waking hours provides an almost constant supply of carbohydrates and sugars (1). This leads to rapid demineralization of tooth enamel and an increase in the risk of dental caries due to prolonged contact between cariogenic bacteria on the susceptible tooth surface and the sugars in the consumed liquid (1, 14). The sugars in the liquid pool around the child's teeth and gums feed the bacteria there and decay is the result (15). The process may start before the teeth are even fully erupted. Upper incisors (upper front teeth) are particularly vulnerable; the lower incisors are generally protected by the tongue (15). The damage begins as white lesions and progresses to brown or black discoloration typical of caries (15). When early childhood caries are severe, the decayed crowns may break off and the permanent teeth developing below may be damaged (15). Undiagnosed dental caries and other oral pain may contribute to feeding problems and failure to thrive in young children (15). Use of a bottle or cup, containing fermentable carbohydrates, without restriction is a risk because the more times a child consumes solid or liquid food, the higher the caries risk (1). Cariogenic snacks eaten between meals place the toddler most at risk for caries development; this includes the habit of continually sipping from cups (or bottles) containing cariogenic liquids (juice, milk, soda, or sweetened liquid) (15). If inappropriate use of the bottle persists, the child is at risk of toothaches, costly dental treatment, loss of primary teeth, and developmental lags on eating and chewing. If this continues beyond the usual weaning period, there is a risk of decay to permanent teeth.

425.4 Routinely using feeding practices that disregard the developmental needs or stage of the child.

The interactions and communication between a caregiver and child during feeding and eating influence a child's ability to progress in eating skills and consume a nutritionally adequate diet. These interactions comprise the "feeding relationship" (9). A dysfunctional feeding relationship, which could be characterized by a caregiver misinterpreting, ignoring, or overruling a young child's innate capability to regulate food intake based on hunger, appetite and satiety, can result in poor dietary intake and impaired growth (16, 17). Parents who consistently attempt to control their children's food intake may give children few opportunities to learn to control their own food intake (18). This could result in inadequate or excessive food intake, future problems with food regulation, and problems with growth and nutritional status. Instead of using approaches such as bribery, rigid control, struggles, or short-order cooking to manage eating, a healthier approach is for parents to provide nutritious, safe foods at regular meals and snacks, allowing children to decide how much, if any, they eat (1, 17). Young children should be able to eat in a matter-of-fact way sufficient quantities of the foods that are given to them, just as they take care of other daily needs (3). Research indicates that restricting access to foods (i.e., high fat foods) may enhance the interest of 3- to 5-year old children in those foods and increase their desire to obtain and consume those foods. Stringent parental controls on child eating have been found to potentiate children's preference for high-fat energy dense foods, limit children's acceptance of a variety of foods, and disrupt children's regulation of energy intake (19, 20). Forcing a child to clean his or her plate may lead to overeating or development of an aversion to certain foods (7). The toddler and preschooler are striving to be independent (7). Self-feeding is important even though physically they may not be able to handle feeding utensils or have good eye-hand coordination (7). Children should be able to manage the feeding process independently and with dispatch, without either unnecessary dawdling or hurried eating (3, 12). Self-feeding milestones include (1): During infancy, older infants progress from semisolid foods to thicker and lumpier foods to soft pieces to finger-feeding table food (9). By 15 months, children can manage a cup, although not without some spilling. At 16 to 17 months of age, well-defined wrist rotation develops, permitting the transfer of feed from the bowl to the child's mouth with less spilling. The ability to lift the elbow as the spoon is raised and to flex the wrist as the spoon reaches the mouth follows. At 18 to 24

months, they learn to tilt a cup by manipulation with the fingers. Despite these new skills, 2-year-old children often prefer using their fingers to using the spoon. Preschool children learn to eat a wider variety of textures and kinds of food (3, 7). However, the foods offered should be modified so that the child can chew and swallow the food without difficulty (3).

425.5 Feeding foods to a child that could be contaminated with harmful microorganisms.

According to the AAP, to prevent food-borne illness, the foods listed below should not be fed to young children or infants (1). All of the foods have been implicated in selected outbreaks of food-borne illness, including in children. Background information regarding foods that could be contaminated with harmful microorganisms is also included below:

- Unpasteurized fruit or vegetable juice--Only pasteurized juice is safe for infants, children, and adolescents (10). Pasteurized fruit juices are free of microorganisms (10). Unpasteurized juice may contain pathogens, such as *Escherichia coli*, *Salmonella*, and *Cryptosporidium* organisms (10, 21). These organisms can cause serious disease, such as hemolytic-uremic syndrome, and should never be fed to infants and children (10). Unpasteurized juice must contain a warning on the label that the product may contain harmful bacteria (10, 22).
- Unpasteurized dairy products or soft cheeses such as feta, Brie, Camembert, blue-veined, and Mexican-style cheese--Young children or infants should not eat raw or unpasteurized milk or cheeses (1)—unpasteurized dairy products could contain harmful bacteria, such as *Brucella* species, that could cause young children to contract a dangerous food borne illness. The American Academy of Pediatrics also recommends that young children should not eat soft cheeses such as feta, Brie, Camembert, blue-veined, and Mexican-style cheese—these foods could contain *Listeria* bacteria (hard cheeses, processed cheeses, cream cheese, cottage cheese, and yogurt need not be avoided) (1).
- Raw or undercooked meat, fish, poultry, or eggs--Young children or infants should not eat raw or undercooked meat or poultry, raw fish or shellfish, including oysters, clams, mussels, and scallops (1)—these foods may contain harmful bacteria or parasites that could cause children to contract a dangerous food borne illness.
- Raw vegetable sprouts (alfalfa, clover, bean, and radish)--Sprouts can cause potentially dangerous *Salmonella* and *E. coli* O157 infection. Sprouts grown under clean conditions in the home also present a risk because bacteria may be present in seed. Cook sprouts to significantly reduce the risk of illness (23).
- Deli meats, hot dogs, and processed meats (avoid unless heated until steaming hot)—these foods have been found to be contaminated with *Listeria monocytogenes*; if adequately cooked, this bacteria is destroyed.

425.6 Routinely feeding a diet very low in calories and/or essential nutrients.

Highly restrictive diets prevent adequate intake of nutrients, interfere with growth and development, and may lead to other adverse physiological effects (24). Well-balanced vegetarian diets with dairy products and eggs are generally associated with good health. However, strict vegan diets may be inadequate in calories, vitamin B12, vitamin D, calcium, iron, protein and essential amino acids needed for growth and development (25). The more limited the diet, the greater the health risk. Given the health and nutrition risks associated with highly restrictive diets, WIC can help the parent to assure that the child consumes an adequate diet to optimize health during critical periods of growth as well as for the long term.

425.7 Feeding dietary supplements with potentially harmful consequences.

A child consuming inappropriate or excessive amounts of single or multivitamin or mineral or herbal remedy not prescribed by a physician is at risk for a variety of adverse effects including harmful nutrient interactions, toxicity, and teratogenicity (1, 26). Like drugs, herbal or botanical preparations have chemical and biological activity, may have side effects, and may interact with certain medications--these interactions can cause problems and can even be dangerous (27). Botanical supplements are not necessarily safe because the safety of a botanical depends on many things, such as its chemical makeup, how it works in the body, how it is prepared, and the dose used (27). While some herbal teas may be safe, some have undesirable effects, particularly on young children who are fed herbal teas or who receive breast milk from mothers who have ingested herbal teas (28). Examples of teas with potentially harmful effects to children include: licorice, comfrey leaves, sassafras, senna, buckhorn bark, cinnamon, wormwood, woodruff, valerian, foxglove, pokeroor or pokeweed, periwinkle, nutmeg, catnip, hydrangea, juniper, Mormon tea, thorn apple, yohimbe bark, lobelia, oleander, Mat  , kola nut or gotu cola, and chamomile (28-30).

425.8 Routinely not providing dietary supplements recognized as essential by national public health policy when a child's diet alone cannot meet nutrient requirements.

Depending on a child's specific needs and environmental circumstances, certain dietary supplements may be recommended by the child's health care provider to ensure health. For example, fluoride supplements may be of benefit in reducing dental decay for children living in fluoride-deficient areas (1, 31). In addition, the AAP recommends that children who are ingesting less than 1 liter (1 quart) per day of vitamin D-fortified formula or milk should receive a vitamin D supplement of 400 IU/day (32). Since 1 quart of milk is in excess of the recommended 2 cups of milk per day for pre-school children (33), most children will require a vitamin D supplement.

425.9 Routine ingestion by child of nonfood items (Pica).

Pica is the compulsive eating of nonnutritive substances and can have serious medical implications (33). Pica is observed most commonly in areas of low socioeconomic status and is more common in women (especially pregnant women) and in children (30). Pica has also been seen in children with obsessive-compulsive disorders, mental retardation, sickle cell disease (34-36). Complications of this disorder include: iron-deficiency anemia, lead poisoning, intestinal obstruction, acute toxicity from soil contaminants, and helminthic infestations (34, 37, 38).

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